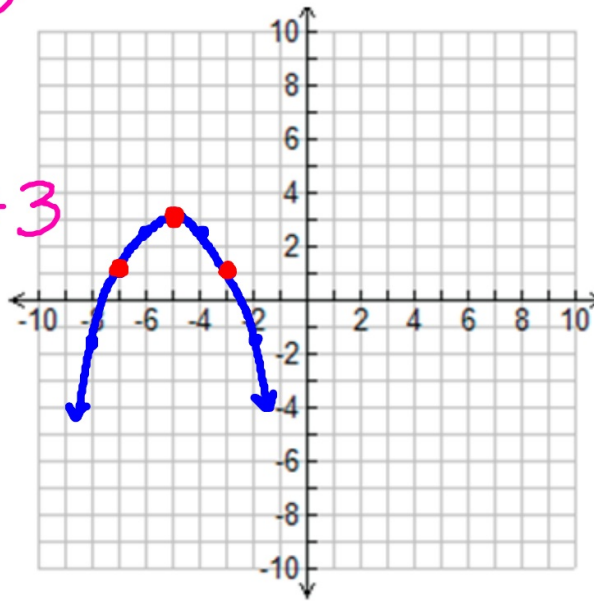


Bellwork: 11/13/12

Find the equation of the quadratic function graphed below:

vertex:  $(-5, 3)$   
 $a = -\frac{1}{2}$   
 $y = -\frac{1}{2}(x+5)^2 + 3$

over 2 down 2  
up 4



Section 4.2 - Standard (General) Form of a Quadratic

Standard Form:  $y = ax^2 + bx + c$

to find the x value (h):

Vertex:  $-\frac{b}{2a}$

to find the y value (k):

take what you got for x + plug into  
every x in equation.

$$ax^2+bx+c$$

$$a(x-h)^2+k$$

Converting from Standard (General) Form to Vertex form:

example 1:  $y = x^2 + 2x + 3$   
 $a=1 \quad b=2 \quad c=3$

Find the vertex:

<u>x value:</u>	}	<u>y value:</u>
$\frac{-b}{2a} = \frac{-2}{2(1)} = \frac{-2}{2} = -1$		$(-1)^2 + 2(-1) + 3$
		$1 - 2 + 3$ $-1 + 3 = 2$

Use the vertex and the given "a" value to put in vertex form:

vertex:  $(-1, 2)$   
 $a = 1$

$$y = 1(x+1)^2 + 2$$

or

$$y = (x+1)^2 + 2$$

Convert each of the following into vertex form. Then graph.

example 2:  $y = x^2 + 2x + 1$   
 $a=1 \quad b=2 \quad c=1$

vertex:

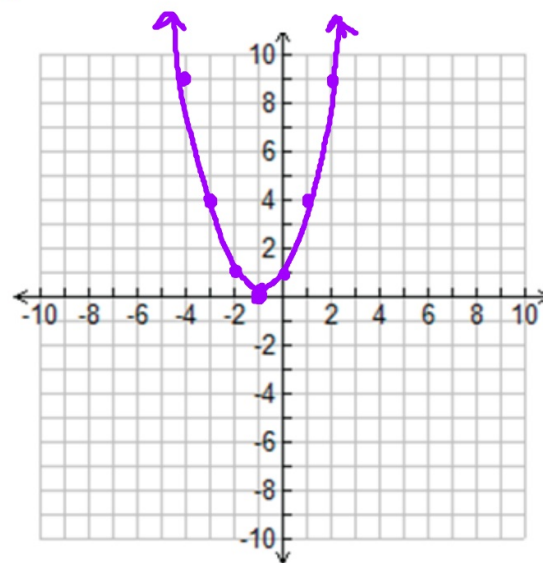
<u>x value</u>	}	<u>y value</u>
$\frac{-b}{2a} = \frac{-2}{2(1)} = \frac{-2}{2}$		$(-1)^2 + 2(-1) + 1$
$-1$		$1 - 2 + 1$ $0$

Vertex form:

$(-1, 0)$

$a = 1$

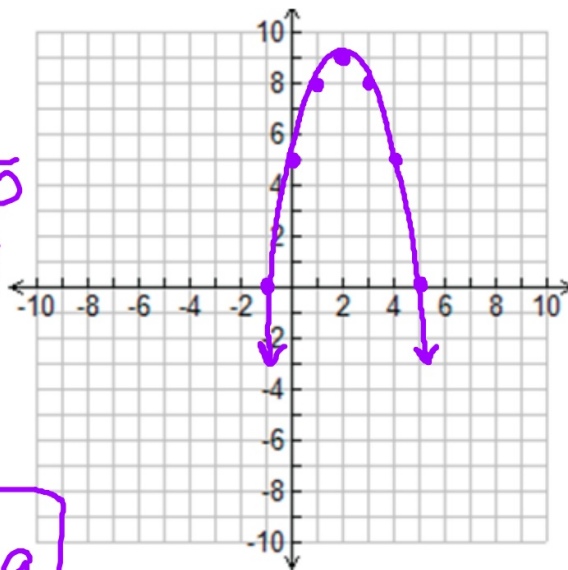
$$y = (x+1)^2$$



example 3:  $y = -x^2 + 4x + 5$   
 $a = -1$   $b = 4$   $c = 5$

Vertex:

<u>x value</u>	{	<u>y value</u>
$\frac{-b}{2a} = \frac{-4}{2(-1)} = \frac{-4}{-2}$		$-1(a)^2 + 4(a) + 5$
2		$-4 + 8 + 5$
		9



vertex form:

$(2, 9)$

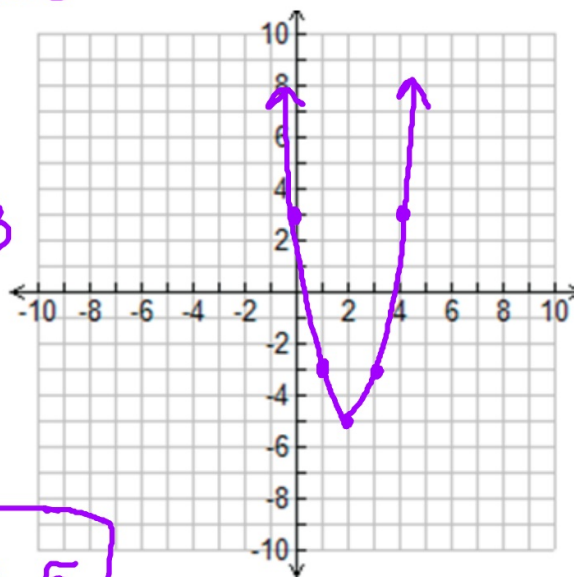
$a = -1$

$$y = -(x-2)^2 + 9$$

example 4:  $y = 2x^2 - 8x + 3$   
 $a = 2$   $b = -8$   $c = 3$

Vertex:

<u>x value</u>	{	<u>y value</u>
$\frac{-b}{2a} = \frac{8}{2(2)} = \frac{8}{4}$		$2(a)^2 - 8(a) + 3$
2		$8 - 16 + 3$
		$-8 + 3$ -5



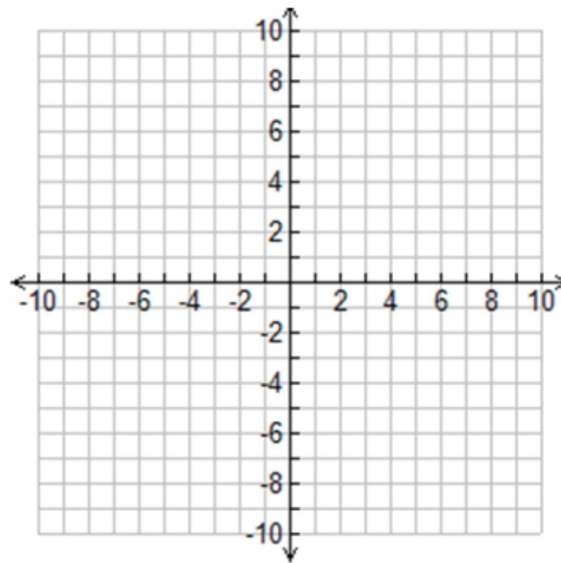
Vertex form:

$(2, -5)$

$a = 2$

$$y = 2(x-2)^2 - 5$$

example 5:  $y = 2x^2 + 12x + 7$



## Homework:

pg 206 # 17, 19, 26, 27, 30  
convert to vertex form,  
then graph.